

Counterflow Regolith Heat Exchanger, Phase I

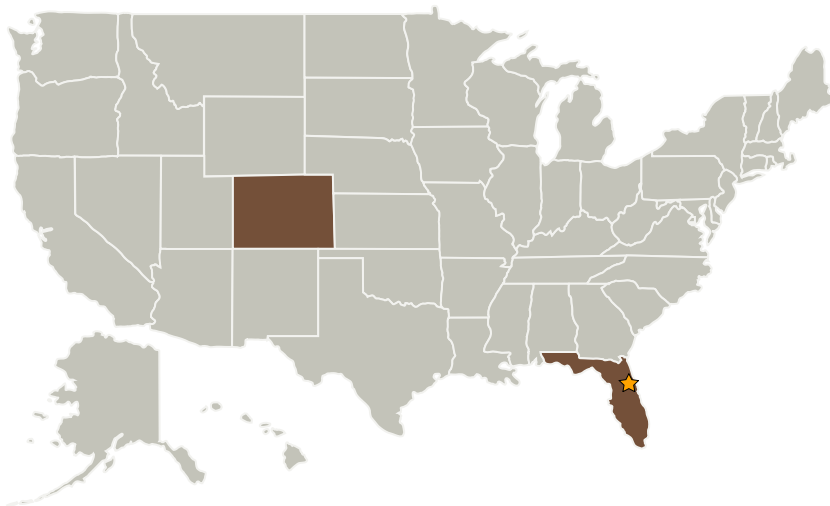
Completed Technology Project (2009 - 2009)



Project Introduction

The counterflow regolith heat exchanger (CoRHE) is a device that transfers heat from hot regolith to cold regolith. The CoRHE is essentially a tube-in-tube heat exchanger with internal and external augers attached to the inner, rotating tube to move the regolith. Hot regolith in the outer tube is moved in one direction by a right-handed auger and the cool regolith in the inner tube is moved in the opposite by a left-handed auger attached to the inside of the rotating tube. In this counterflow arrangement a large fraction of the heat from the expended regolith is transferred to the new regolith. The spent regolith leaves the heat exchanger close to the temperature of the cold new regolith and the new regolith is pre-heated close to the initial temperature of the spent regolith. Using the CoRHE can reduce the heating requirement of a lunar ISRU system by 80%, reducing the total power consumption by a factor of two.

Primary U.S. Work Locations and Key Partners



Counterflow Regolith Heat Exchanger, Phase I

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Counterflow Regolith Heat Exchanger, Phase I

Completed Technology Project (2009 - 2009)



Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Pioneer Astronautics	Supporting Organization	Industry Historically Underutilized Business Zones (HUBZones)	Lakewood, Colorado

Primary U.S. Work Locations

Colorado	Florida
----------	---------

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.2 Heat Transport